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Vitamin A

Vitamin A is deficient in most feedstuffs and can easily be toxic as a consequence of over supplementation. Compared to wheat or sorghum based diets, corn based diets contain less vitamin A and are more likely to cause deficiencies.

Vitamin A deficiency

In vitamin deficiency the epithelial basal cells differentiate into squamous cells, which may become stratified and keratinised to form a hard, dry skin.

Vitamin A deficiency in the embryo causes an abnormal cardiovascular system, resulting in embryonic death in the first week of incubation. Any embryos which survive to hatching produce very weak chicks that soon die.

In growing chicks and poults, vitamin A deficiency results in reduced growth, depression, inappetence and increased mortality from secondary infections. In addition, unsteady gait and postural imbalance can occur. Other changes associated with vitamin A deficiency include epithelial damage in the mouth cavity, pharynx and gullet, periorbital oedema and caseous material under the eyelids accompanied by lachrymation. Vitamin A deficiencies can adversely affect development of the bursa of Fabricius and thymus and thereby impair normal immunity.

As a result of vitamin A storage in the liver it often takes 2-6 months for the signs of vitamin A deficiency to occur in adult birds. Vitamin A deficient hens show weakness, weight loss, ruffled feathers, a sharp drop in egg production, blood spots in eggs and an increased susceptibility to infections. Eye changes similar to those previously described also occur and can result in blindness. In vitamin A deficient layers an increased frequency of atretic ovarian follicles are seen in birds exposed to a deficiency over 5-8 months.

Pathology

The first lesions are seen in the oesophagus (gullet) and pharynx where the epithelium is replaced by keratinised epithelium. Small white nodules can be seen in the mouth, oesophagus and pharynx as well as in the nasal cavities which enlarge as the deficiency progresses. This is often accompanied by some ulceration.

On the basis of clinical signs and lesions it can be hard to differentiate infectious coryza, infectious laryngotracheitis, fowlpox or infectious bronchitis from vitamin A deficiency.

Chronic vitamin A deficiency can result in kidney damage, which is usually followed by gout.

Treatment

Treatment is by vitamin A administration and, as its absorption is rapid, birds not in the advanced stages of deficiency respond quickly to treatment.

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